Exponent

Draft—Work in Progress

EXTERNAL MEMORANDUM

TO: Barb Irwin

FROM: Kristin Robrock, Ph.D., P.E.

DATE: July 15, 2014

PROJECT: 1107265.000

SUBJECT: Concrete Trench Sampling Plan

This sampling plan provides sampling procedures for the concrete trench material from Units 1–4 of the Power Block foundation at the South Bay Power Plant (the Site), which is undergoing below-ground demolition. A network of drainage trenches is present on the Power Block foundation. The concrete trenches from Units 1 and 2 have been removed from the Power Block foundation and are currently stockpiled on Site. The concrete trenches from Units 3 and 4 are still in place on the Power Block foundation. Previously, a total of 23 samples were collected from the concrete trenches before the start of demolition, and all were found to have concentrations of polychlorinated biphenyls (PCBs) less than the guidelines for concrete reuse established for the Site (up to 0.74 mg/kg, depending on the Aroclor) (Bodhi Group 2014; Exponent 2013). The trench samples were distributed evenly among the four Units, although the sampling frequency was slightly higher in the Unit 2 trench, where a hose that conveyed liquids from the transformer sumps to the north of the Power Block was found (by sample PBT001; see Figure 1). Three samples were also collected from the Power Block foundation outside of the trenches in areas exhibiting the largest amount of staining; these samples were found to have PCB concentrations well below the reuse criteria for the site. The U.S. Environmental Protection Agency (EPA) has requested that additional samples be collected from the concrete trenches and analyzed for PCBs to support the Notification of Self-Implementing Cleanup submitted by Dynegy to EPA on June 9, 2014 (Dynegy 2014).

Sampling of Units 1 and 2 Trench Stockpiles

The Units 1 and 2 trenches have been removed from the Power Block foundation, stockpiled on plastic sheeting, and sprayed with Hydromulch, a stabilizing agent, per the Demolition Soil Management Plan (Exponent 2013). The Units 1 and 2 trenches are currently stockpiled in two separate rows and consist of slabs of the trench surfaces along with smaller fragments of trench material. Core samples collected in the Power Block foundation after removal of the 6-inch-thick trenches (i.e. under the trenches) were all non-detect for PCBs.

While Subpart R of 40 CFR 761 provides procedures for sampling stockpiled waste materials, this sampling procedure calls for creating composite samples representative of the average concentration of the stockpile. To better characterize the surfaces of the concrete trenches that were exposed to PCB-containing liquids, and to target the potentially highest PCB concentrations present in the stockpile, eight grab samples will be collected from each Unit stockpile. Six grab samples will be collected from randomly selected slabs of trench surfaces, and two samples will be collected randomly from the smaller trench fragments. A duplicate sample will be collected from one of the trench slabs. This amounts to eight samples per Unit, plus a duplicate, for a total of 17 samples for Units 1 and 2. The samples will be collected following the collection procedures in §761.286 of Subpart O. Specifically, a 1-inch-diameter corer will be used to collect at least 20 milliliters (approximately 0.7 ounce) of concrete to a maximum depth of 7.5 centimeters. The samples will be sent to Eurofins Calscience, Inc., for PCB analysis per EPA Method 8082. Subpart O is provided in Attachment 1.

Sampling of Units 3 and 4 Trenches

The Units 3 and 4 trenches are still in place in the Power Block foundation. Six samples from each Unit will be collected following Subpart O of 40 CFR 761. Given the narrow nature of the trenches (2 feet wide), the grid pattern on a 5-foot spacing recommended in Subpart O cannot be applied reasonably. Therefore, sample locations have been selected within the trench network to target areas where staining is observed and where two trenches intersect, such that a sample is representative of more than one trench. Four samples will be collected along the bottom of the trenches at trench intersections in the locations indicated on Figure 1. These locations, shown in Figure 1, were selected to supplement the samples collected previously in the Units 3 and 4 trenches. Two samples will be collected in stained areas of the trench that are to be identified during field inspection. Stained areas along the sidewalls of the trench may be collected if the sidewall is the most stained part of the trench. One duplicate sample will also be collected at one of the sampling locations in either Unit 3 or 4. In summary, six samples will be collected from each Unit along with one duplicate, amounting to a total of 13 samples. The samples will be collected following the collection procedures in §761.286 of Subpart O (see Attachment 1). The samples will be sent to Eurofins Calscience, Inc., for PCB analysis per EPA Method 8082.

In addition, samples may be collected from the Power Block foundation in Units 3 and 4 outside of the trenches. The Power Block foundation in Units 3 and 4 will be inspected, and if substantial staining is observed, those areas will be sampled. The areas sampled previously will not be resampled. The samples will be collected following the collection procedures in §761.286 of Subpart O.

Re-Sampling of Crushed Concrete

As specified in the Demolition Soil Management Plan for the Site, all crushed concrete will undergo an additional round of sampling for lead, total petroleum hydrocarbons (TPH), and

PCBs before being reused on Site following the guidelines of the Department of Toxic Substances Control (Exponent 2013; DTSC 2001). This crushed concrete sampling, while different from the procedures outlined in Subpart R, serves to characterize the average concentration of material prior to reuse. DTSC guidance calls for one sample to be collected for each 250 cubic yards of stockpiled material for volumes less than 1000 cubic yards. Given that the Units 1 and 2 stockpiles are approximately 600 cubic yards each, three samples will be collected from each these stockpiles after the concrete is crushed. While the Units 3 and 4 trenches have not yet been removed from the Power Block concrete foundation, if the results of the trench sampling indicate that the concrete is acceptable for reuse (i.e., <0.74 mg/kg PCBs), these trenches will not be segregated from the rest of the Power Block foundation. Rather, the Units 3 and 4 trench materials will be crushed, along with the rest of the Units 3 and 4 Power Block foundation, and sampled following the DTSC (2001) guidance. Crushed concrete will be stockpiled pending receipt of sampling results for lead, TPH, and PCBs, demonstrating that the material meets the site-specific reuse criteria before the crushed concrete is reused at the Site.

References

Bodhi Group. 2014. Results of Power Block PCB sampling, below ground demolition project, South Bay Power Plant, 990 Bay Boulevard, Chula Vista, California. January 28.

DTSC. 2001. Information advisory clean imported fill material. California Department of Toxic Substances Control. Available at: http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf.

Dynegy. 2014. South Bay Power Plant—belowground demolition project—demolition/reuse of power block trench and sump concrete; notification of Self-Implementing Cleanup under 40 CFR §761.61(a)(3). Submitted to U.S. Environmental Protection Agency, Region 9. June 9.

Exponent. 2013. Demolition soil management plan for Dynegy South Bay Power Plant, Chula Vista, California. Exponent, Inc., Oakland, CA. September 9.

Figure 1

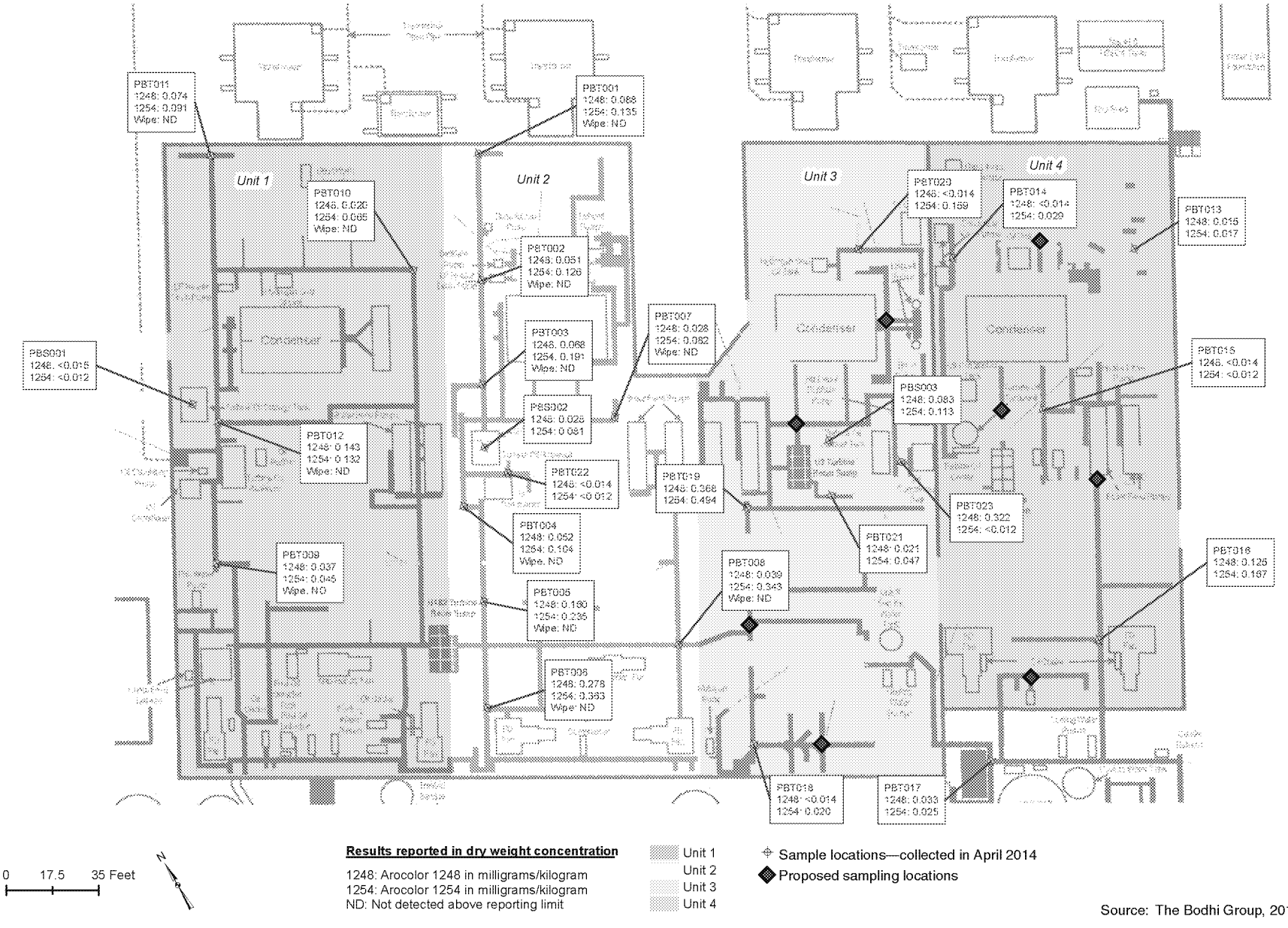

Figure 1. Trench sampling locations

Exponent

1107265.000 07/15/2014 WA

Attachment 1

Subpart O of 40 CFR 761

ELECTRONIC CODE OF FEDERAL REGULATIONS

e-CFR Data is current as of July 10, 2014

Title 40: Protection of Environment
PART 761—POLYCHLORINATED BIPHENYLS (PCBs) MANUFACTURING, PROCESSING, DISTRIBUTION IN COMMERCE, AND USE PROHIBITIONS

Subpart O—Sampling To Verify Completion of Self-Implementing Cleanup and On-Site Disposal of Bulk PCB Remediation Waste and Porous Surfaces in Accordance With §761.61(a)(6)

Contents

SOURCE: 63 FR 35465, June 29, 1998, unless otherwise noted.

Back to Top

§761.280 Application and scope.

Follow the procedures in this subpart when sampling to verify completion of the cleanup for self-implementing, on-site disposal of bulk PCB remediation waste and porous surfaces consistent with the levels of §761.61(a)(4)(i) and (iii). The objective of this subpart is not to search for new contamination. Confirmation of compliance with the cleanup levels in §761.61(a)(4) is only verifiable for the area sampled in accordance with this subpart. Do not make conclusions or extrapolations about PCB concentrations outside of the area which has been cleaned up and verified based on the results of this verification sampling.

Back to Top

§761.283 Determination of the number of samples to collect and sample collection locations.

This section addresses how to determine the number of samples to collect and sample collection locations for bulk PCB remediation waste and porous surfaces destined to remain at a cleanup site after cleanup.

(a) *Minimum number of samples.* (1) At each separate cleanup site at a PCB remediation waste location, take a minimum of three samples for each type of bulk PCB remediation waste or porous surface at the cleanup site, regardless of the amount of each type of waste that is present. There is no upper limit to the number of samples required or allowed.

(2) This is an example of how to calculate the minimum number of required samples at a PCB remediation waste location. There are three distinct cleanup sites at this example location: a loading dock, a transformer storage lot, and a disposal pit. The minimum number of samples to take appears in parentheses after each type of waste for each cleanup site. The PCB remediation wastes present at the loading dock are concrete (three samples) and clay soil (three samples). The non-liquid PCB remediation wastes present at the transformer storage lot are oily soil (three samples), clay soil (three samples) and gravel (three samples). The PCB remediation wastes present at the disposal pit are sandy soil (three samples), clay soil (three samples), oily soil (three samples), industrial sludge (three samples), and gravel (three samples).

(b) *Selection of sample locations—general.* (1)(i) Use a square-based grid system to overlay the entire area to be sampled. Orient the grid axes on a magnetic north-south line centered in the area and an east-west axis perpendicular to the magnetic north-south axis also centered in the area.

(ii) If the site is recleaned based on the results of cleanup verification conducted in accordance with §761.61(a)(6), follow the procedures in paragraph (b) of this section for locating sampling points after the recleaning, but reorient the grid axes established in paragraph (b)(1)(i) of this section by moving the origin one meter in the direction of magnetic north and one meter in the direction east of magnetic north.

(2) Mark out a series of sampling points 1.5 meters apart oriented to the grid axes. The sampling points shall proceed in every direction to the extent sufficient to result in a two-dimensional grid completely overlaying the sampling area.

(3) Collect a sample at each point if the grid falls in the cleanup area. Analyze all samples either individually or according to the compositing schemes provided in the procedures at §761.289. So long as every sample collected at a grid point is analyzed as either an individual sample or as part of a composite sample, there are no other restrictions on how many samples are analyzed.

(c) *Selection of sample locations—small cleanup sites.* When a cleanup site is sufficiently small or irregularly shaped that a square grid with a grid interval of 1.5 meters will not result in a minimum of three sampling points for each type of bulk PCB remediation waste or porous surface at the cleanup site, there are two options.

(1) Use a smaller square grid interval and the procedures in paragraph (b) of this section.

(2) Use the following coordinate-based random sampling scheme. If the site is recleaned based on the results of cleanup verification conducted in accordance with §761.61(a)(6), follow the procedures in this section for locating sampling points after the recleaning, but select three new pairs of sampling coordinates.

(i) Beginning in the southwest corner (lower left when facing magnetic north) of the area to be sampled, measure in centimeters (or inches) the maximum magnetic north-south dimension of the area to be sampled. Next, beginning in the southwest corner, measure in centimeters (or inches) the maximum magnetic east-west dimension of the area to be sampled. Designate the north-south and east-west dimensions (describing the west and south boundaries, respectively, of the area to be sampled), as the reference axes of a square-based grid system.

(ii) Use a random number table or random number generator to select a pair of coordinates that will locate the sample within the area to be sampled. The first coordinate in the pair is the measurement on the north-south axis. The second coordinate in the pair is the measurement on the east-west axis. Collect the sample at the intersection of an east-west line drawn through the measured spot on the north-south axis, and a north-south line drawn through the measured spot on the east-west axis. If the cleanup site is irregularly shaped and this intersection falls outside the cleanup site, select a new pair of sampling coordinates. Continue to select pairs of sampling coordinates until three are

selected for each type of bulk PCB remediation waste or porous surface at the cleanup site.

(d) *Area of inference.* Analytical results for an individual sample point apply to the sample point and to an area of inference extending to four imaginary lines parallel to the grid axes and one half grid interval distant from the sample point in four different directions. The area of inference forms a square around the sample point. The sides of the square are parallel to the grid axes and one grid interval in length. The sample point is in the center of the square area of inference. The area of inference from a composite sample is the total of the areas of the individual samples included in the composite.

Back to Top

§761.286 Sample size and procedure for collecting a sample.

At each selected sampling location for bulk PCB remediation waste or porous surfaces, collect at least 20 milliliters of waste, or a portion of sufficient weight for the chemical analyst to measure the concentration of PCBs and still have sufficient analytical detection sensitivity to reproducibly measure PCBs at the levels designated in §761.61(a)(4). Use a core sampler having a diameter ≥2 cm and ≤3 cm. Collect waste to a maximum depth of 7.5 cms.

Back to Top

§761.289 Compositing samples.

Compositing is a method of combining several samples of a specific type of bulk PCB remediation waste or porous surface from nearby locations for a single chemical analysis. There are two procedures for compositing bulk PCB remediation waste samples. These procedures are based on the method for selecting sampling site locations in §761.283(b) and (c). The single chemical analysis of a composite sample results in an averaging of the concentrations of its component samples. The area of inference of a composite is determined by the area of inference of each of its component samples as described in §761.283(d). Compositing is not mandatory. However, if compositing is used, it must be performed in accordance with the following procedures.

(a) *Compositing in the field or in a laboratory.* Compositing may occur either in the field or in a laboratory. Prepare composite samples using equal volumes of each constituent or component sample. Composited samples must be from the same type of bulk PCB remediation waste or porous surface (see the example at §761.283(a)(2)). Mix composite samples thoroughly. From each well-mixed composite sample, take a portion of sufficient weight for the chemical analyst to measure the concentration of PCBs and still have sufficient analytical detection sensitivity to reproducibly measure PCBs at the levels designated in §761.61(a)(4).

(b)(1) *Compositing from samples collected at grid points in accordance with §761.283(b).* There are two kinds of composite sampling procedures depending on the original source of contamination of the site.

(i) The first procedure is for sites with multiple point sources of contamination (such as an old electrical equipment storage area, a scrap yard, or repair shop) or for unknown sources of contamination. Under this compositing scheme, composite a maximum of nine samples for each type of bulk PCB remediation waste or porous surface at the cleanup site. The maximum dimensions of the area enclosing a nine grid point composite is two grid intervals bounded by three collinear grid points (3.0 meters or approximately 10 feet long). Take all samples in the composite at the same depth. Assure that composite sample areas and individually analyzed samples completely overlay the cleanup site.

(ii) The second procedure is for a single point source of contamination, such as discharge into a large containment area (e.g., pit, waste lagoon, or evaporation pond), or a leak onto soil from a single drum or tank. Single point source contamination may be from a one-time or continuous contamination.

Composites come from two stages: an initial compositing area centered in the area to be sampled, and subsequent compositing areas forming concentric square zones around the initial compositing area. The center of the initial compositing area and each of the subsequent compositing areas is the origin of the grid axes.

(A) *Definition of the initial compositing area.* The initial compositing area is based on a square that contains nine grid points, is centered on the grid origin, and has sides two grid intervals long. The initial compositing area has the same center as this square and sides one half a grid interval more distant from the center than the square. The initial compositing area has sides three grid intervals long.

(B) *Definition of subsequent compositing areas.* Subsequent composite sampling areas are in concentric square zones one grid interval wide around the initial compositing area and around each successive subsequent compositing area. The inner boundary of the first subsequent compositing area is the outer boundary of the initial compositing area. The outer boundary of the first subsequent compositing area is centered on the grid origin, has sides one grid interval more distant from the grid origin than the inner boundary, and is two grid intervals longer on a side than the inner boundary. The inner boundary of each further subsequent compositing area is the outer boundary of the previous subsequent compositing area. The outer boundary of each further subsequent compositing area is centered on the grid origin, has sides one grid interval more distant from the grid origin than the inner boundary, and is two grid intervals longer on a side than the inner boundary.

(C) *Taking composite samples from the initial and subsequent compositing areas.* (*1*) Select composite sampling areas from the initial compositing area and subsequent compositing areas such that all grid points in the initial compositing area and subsequent compositing areas are part of a composite or individual sample.

(*2*) A person may include in a single composite sample a maximum of all nine grid points in the initial compositing area. The maximum number of grid points in a composite sample taken from a subsequent compositing area is eight. These eight grid points must be adjacent to one another in the subsequent compositing area, but need not be collinear.

(2) *Compositing from samples taken at grid points or pairs of coordinates in accordance with §761.283(c).* Samples collected at small sites are based on selecting pairs of coordinates or using the sample site selection procedure for grid sampling with a smaller grid interval.

(i) *Samples collected from a grid having a smaller grid interval.* Use the procedure in paragraph (b)(1)(i) of this section to composite samples and determine the area of inference for composite samples.

(ii) *Samples collected from pairs of coordinates.* All three samples must be composited. The area of inference for the composite is the entire area sampled.

Back to Top

§761.292 Chemical extraction and analysis of individual samples and composite samples.

Use either Method 3500B/3540C or Method 3500B/3550B from EPA's SW-846, Test Methods for Evaluating Solid Waste, or a method validated under subpart Q of this part, for chemical extraction of PCBs from individual and composite samples of PCB remediation waste. Use Method 8082 from SW-846, or a method validated under subpart Q of this part, to analyze these extracts for PCBs.

Back to Top

§761.295 Reporting and recordkeeping of the PCB concentrations in samples.

(a) Report all sample concentrations for bulk PCB remediation waste and porous surfaces on a

dry weight basis and as micrograms of PCBs per gram of sample (ppm by weight).

(b) Record and keep on file for 3 years the PCB concentration for each sample or composite sample.

Back to Top

§761.298 Decisions based on PCB concentration measurements resulting from sampling.

(a) For grid samples which are chemically analyzed individually, the PCB concentration applies to the area of inference as described in §761.283(d).

(b) For grid samples analyzed as part of a composite sample, the PCB concentration applies to the area of inference of the composite sample as described in §761.283(d) (i.e., the area of inference is the total of the areas of the individual samples included in the composite).

(c) For coordinate pair samples analyzed as part of a composite sample, in accordance with §§761.283(c)(2) and 761.289(b)(2)(ii), the PCB concentration applies to the entire cleanup site.

Back to Top
